Summary Specification

KAI-08670 Image Sensor

DESCRIPTION

The KAI-08670 Image Sensor is an 8.6-megapixel CCD in an APS-H optical format. Based on the TRUESENSE 7.4 micron Interline Transfer CCD Platform, the sensor provides very high smear rejection and up to 82 dB linear dynamic range through the use of a unique dual-gain amplifier. A flexible readout architecture enables use of 1, 2, or 4 outputs for full resolution readout up to 12 frames per second, while a vertical overflow drain structure suppresses image blooming and enables electronic shuttering for precise exposure control.

The sensor is available with the TRUESENSE Sparse Color Filter Pattern, a technology which provides a 2x improvement in light sensitivity compared to a standard color Bayer part.

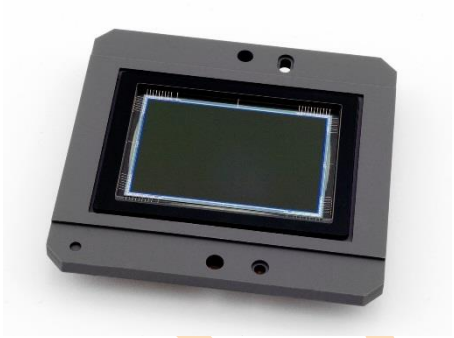
The sensor is package and pin-compatible with the KAI-16050 Image Sensor, and shares common pin-out and electrical configurations with a full family of Truesense Imaging Interline Transfer CCD image sensors, allowing a single camera design to be leveraged in support of multiple devices.

FEATURES

- Superior smear rejection
- Up to 82 dB linear dynamic range
- Bayer Color Pattern, TRUESENSE Sparse Color Filter Pattern, and Monochrome configurations
- Progressive scan & flexible readout architecture
- High frame rate
- High sensitivity - Low noise architecture
- Package pin reserved for device identification

APPLICATIONS

- Industrial Imaging and Inspection
- Traffic
- Surveillance



Parameter	Typical Value
Architecture	Interline CCD; Progressive Scan
Total Number of Pixels	3672 (H) x 2472 (V)
Number of Effective Pixels	3624 (H) x 2424 (V)
Number of Active Pixels	3600 (H) x 2400 (V)
Pixel Size	7.4 µm (H) x 7.4 µm (V)
Active Image Size	26.64 mm (H) x 17.76 mm (V) 32 mm (diag) APS-H optical format
Aspect Ratio	3:2
Number of Outputs	1, 2, or 4
Charge Capacity	44,000 electrons
Output Sensitivity	9.7 µV/e^- (low), 33 µV/e^- (high)
Quantum Efficiency R, G, B (-FXA, -QXA) Pan (-AXA, -QXA)	 33%, 39%, 40% 48%
Read Noise (f = 40MHz)	12 electrons rms
Dark Current Photodiode VCCD	 1 electrons/s 145 electrons/s
Dark Current Doubling Temp Photodiode VCCD	 7 °C 9 °C
Dynamic Range High gain amp (40 MHz) Dual amp, 2x2 bin (40 MHz)	 70 dB 82 dB
Charge Transfer Efficiency	0.999999
Blooming Suppression	>1000 X
Smear	-115 dB
Image Lag	<10 electrons
Maximum Pixel Clock Speed	40 MHz
Maximum Frame Rates Quad Output Dual Output Single Output	 12 fps 6 fps 3 fps
Package	72 pin PGA
Cover Glass	AR Coated, 2 Sides

All parameters are specified at T = 40 °C unless otherwise noted.

Ordering Information

KAI-08670 Image Sensor

Catalog Number	Product Name	Description	Marking Code
4H2212 (1)	KAI-08670-AXA-JD-B1	Monochrome, Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 1	KAI-08670-AXA Serial Number
4H2213 (1)	KAI-08670-AXA-JD-B2	Monochrome, Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 2	
4H2189 (2)	KAI-08670-AXA-JD-AE	Monochrome, Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Engineering Grade	
4H2214 (1)	KAI-08670-FXA-JD-B1	Color (Bayer RGB), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 1	KAI-08670-FXA Serial Number
4H2215 (1)	KAI-08670-FXA-JD-B2	Color (Bayer RGB), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 2	
4H2185 (2)	KAI-08670-FXA-JD-AE	Color (Bayer RGB), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Engineering Grade	
4H2216 (1)	KAI-08670-QXA-JD-B1	Color (TRUESENSE Sparse CFA), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 1	KAI-08670-QXA Serial Number
4H2217 (1)	KAI-08670-QXA-JD-B2	Color (TRUESENSE Sparse CFA), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Grade 2	
4H2187 (2)	KAI-08670-QXA-JD-AE	Color (TRUESENSE Sparse CFA), Special Microlens, PGA Package, Sealed Clear Cover Glass with AR coating (both sides), Engineering Grade	

Notes:
1. Standard Grade part numbers are listed for informational purposed only. Standard Grade part numbers are not available for orders at this time. Please contact Truesense Imaging for availability dates
2. Engineering Grade part numbers are listed for informational purposed only. Engineering Grade part numbers are not available for orders at this time. Please contact Truesense Imaging for availability dates

Evaluation Support

Catalog Number	Product Name	Description
4H2207	KEM-4H2207-G2 FPGA Board-14-40	FPGA Board for IT-CCD Evaluation Hardware
4H2209	KEH-4H2209-KAI-72 Pin Imager Board	72 Pin Imager Board for IT-CCD Evaluation Hardware
4H2211	KEL-4H2211-Lens Mount Kit	Lens Mount Kit for IT-CCD Evaluation Hardware

See Application Note *Product Naming Convention* for a full description of the naming convention used for image sensors. For reference documentation, including information on evaluation kits, please visit our web site at www.truesenseimaging.com.

Please address all inquiries and purchase orders to:

Truesense Imaging, Inc.
1964 Lake Avenue
Rochester, New York 14615

Phone: (585) 784-5500
E-mail: info@truesenseimaging.com

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800–282–9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81–3–5817–1050

ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative